



Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV.

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Figure: Recommended Immunization Schedule for Adults and Adolescents with HIV Infection (Last updated August 7, 2019; last reviewed August 7, 2019)

NOTE: Update in Progress

Revision of this section is currently underway, to reflect the Panel's recommendations on the use of newer vaccines in persons with HIV. This section will have guidance that is similar to the Advisory Committee on Immunization Practices (ACIP) which is the accepted standard in the United States but is likely to make recommendations additionally in areas where ACIP is silent. (These immunization schedules are available at www.cdc.gov/vaccines/schedules/hcp/index.html. Detailed information on these and other vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/index.html). Readers should consult individual pathogen chapters for additional guidance beyond the ACIP recommendations presented here.

Table 2 Recommended Adult Immunization Schedule by Medical Condition and Other Indications
United States, 2019

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 count		Asplenia, complement deficiencies	End-stage renal disease, on hemodialysis	Heart or lung disease, alcoholism ¹	Chronic liver disease	Diabetes	Health care personnel ²	Men who have sex with men
			<200	≥200							
IIV or RIV <div>or</div> LAIV	1 dose annually										
	CONTRAINDICATED					PRECAUTION				<div>or</div> 1 dose annually	
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td booster every 10 yrs									
MMR	CONTRAINDICATED			1 or 2 doses depending on indication							
VAR	CONTRAINDICATED			2 doses							
RZV (preferred) <div>or</div> ZVL	DELAY				<div>2 doses at age ≥50 yrs</div> <div>or</div> <div>1 dose at age ≥60 yrs</div>						
	CONTRAINDICATED										
HPV Female	DELAY	3 doses through age 26 yrs			2 or 3 doses through age 26 yrs						
HPV Male		3 doses through age 26 yrs			2 or 3 doses through age 21 yrs						2 or 3 doses through age 26 yrs
PCV13		1 dose									
PPSV23		1, 2, or 3 doses depending on age and indication									
HepA	2 or 3 doses depending on vaccine										
HepB	2 or 3 doses depending on vaccine										
MenACWY	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains										
MenB	PRECAUTION	2 or 3 doses depending on vaccine and indication									
Hib		3 doses HSCT ³ recipients only		1 dose							
<div><div></div> Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection</div> <div><div></div> Recommended vaccination for adults with an additional risk factor or another indication</div> <div><div></div> Precaution—vaccine might be indicated if benefit of protection outweighs risks of adverse reaction</div> <div><div></div> Delay vaccination until after pregnancy if vaccine is indicated</div> <div><div></div> Contraindicated—vaccine should not be administered because of risk for serious adverse reaction</div> <div><div></div> No recommendation</div>											

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction

Delay vaccination until after pregnancy if vaccine is indicated

Contraindicated—vaccine should not be administered because of risk for serious adverse reaction

No recommendation

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.

Abbreviations used for vaccines					
HepA	hepatitis A vaccine	MenACWY	serogroups A, C, W, and Y meningococcal vaccine	Td	tetanus and diphtheria toxoids
HepB	hepatitis B vaccine	MenB	serogroup B meningococcal vaccine	Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
HiB	<i>Haemophilus influenzae</i> type b vaccine	MMR	measles, mumps, and rubella vaccine (live)	VAR	varicella vaccine (live)
HPV Female	human papillomavirus vaccine female	PCV13	13-valent pneumococcal conjugate vaccine	ZVL	zoster vaccine (live)
HPV Male	human papillomavirus vaccine male	PPSV23	23-valent pneumococcal polysaccharide vaccine		
IIV	inactivated influenza vaccine	RIV	recombinant influenza vaccine		
LAIV	influenza vaccine (live, attenuated)	RZV	recombinant zoster vaccine		

Footnotes. Recommended immunization schedule for adults and adolescents with HIV infection, United States, 2017

1. Influenza vaccination

Administer age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) to adults and adolescents annually. Administer IIV or RIV to pregnant women. For adults and adolescents with a history of hives-only egg allergy, administer IIV or RIV. Those with a history of egg allergy other than hives (e.g., angioedema or respiratory distress) may receive IIV or RIV in a medical setting under supervision of a health care provider who can recognize and manage severe allergic conditions. A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm.

2. Tetanus, diphtheria, and pertussis vaccination

Administer 1 dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) to adults and adolescents who were not previously vaccinated with Tdap, followed by a tetanus and diphtheria toxoids (Td) booster every 10 years. Administer 1 dose of Tdap to women during each pregnancy, preferably in the early part of gestational weeks 27–36. Information on the use of Tdap or Td as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm.

3. Measles, mumps, and rubella vaccination

Administer a 2-dose series of measles, mumps, and rubella vaccine (MMR) at least 1 month apart to adults and adolescents with a CD4 cell count ≥ 200 cells/ μ L who do not have evidence of immunity to measles, mumps, and rubella (born before 1957, documentation of receipt of MMR, or laboratory evidence of immunity or disease). Pregnant women with a CD4 cell count ≥ 200 cells/ μ L who do not have immunity to rubella should receive a 2-dose series of MMR at least 1 month apart after pregnancy. Adults and adolescents with a CD4 cell count < 200 cells/ μ L should not receive MMR.

4. Varicella vaccination

Administer a 2-dose series of varicella vaccine (VAR) 3 months apart to adults and adolescents with a CD4 cell count ≥ 200 cells/ μ L who do not have

evidence of immunity to varicella (documented receipt of 2 doses of VAR, born in the United States before 1980, diagnosis of varicella or zoster by a healthcare provider, or laboratory evidence of immunity). Those with a CD4 cell count <200 cells/μL should not receive VAR.

5. Herpes zoster vaccination

There is no recommendation for herpes zoster vaccine (HZV) for adults and adolescents with a CD4 cell count ≥ 200 cells/μL. Those with a CD4 cell count <200 cells/μL should not receive HZV.

6. Human papillomavirus vaccination

Administer a 3-dose series of human papillomavirus (HPV) vaccine at 0, 1–2, and 6 months to adults and adolescents through age 26 years. Pregnant women are not recommended to receive HPV vaccine.

7. Pneumococcal vaccination

Administer 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13) followed by 1 dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 2 months later. Administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23. If the most recent dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 5 years after the last dose of PPSV23.

8. Hepatitis A vaccination

Administer a 2-dose series of single antigen hepatitis A vaccine (HepA) at 0 and 6–12 months or 0 and 6–18 months, depending on the vaccine, or a 3-dose series of combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months to adults and adolescents who may not have a specific risk but wants protection against hepatitis A infection. Administer a HepA-containing vaccine series to adults and adolescents at risk which includes chronic liver disease, receive clotting factor concentrates, men who have sex with men, inject illicit drugs, and travel in countries with endemic hepatitis A.

9. Hepatitis B vaccination

Administer a 3-dose series of single-antigen hepatitis B vaccine (HepB) or combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months.

10. Meningococcal vaccination

Administer a 2-dose primary series of serogroup A, C, W, and Y meningococcal vaccine (MenACWY) at least 2 months apart, and revaccinate every 5 years. Serogroup B meningococcal vaccine (MenB) is not routinely recommended. Young adults and adolescents age 16 through 23 years (preferred age range is 16 through 18 years) may receive MenB (a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-FHbp at 0, 1–2, and 6 months) based on individual clinical decision.

11. *Haemophilus influenzae* type b vaccination

Adults and adolescents with HIV infection are not routinely recommended to receive *Haemophilus influenzae* type b vaccine (Hib). Administer Hib to those with asplenia, hematopoietic stem cell transplant, and other indications.